

377 Medical Students' Perceptions of the Residency Interview Process

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Study Objectives: Each year, residency programs dedicate a significant amount of time, effort and financial resources to selecting and interviewing applicants for residency. Despite the importance of an interview day, factors that the applicants find most valuable are poorly identified.

Methods: An anonymous Web-based survey was sent to all applicants interviewed during the 2012-2013 cycle at one EM residency program. The survey assessed activities they found most valuable on the interview day.

Results: The survey was sent to 211 applicants, with a response rate of 43%. When evaluating the academic merits of a residency program, factors that the applicants found most helpful included program reputation, the ability to attend the weekly morbidity and mortality conference, and the completion of an away rotation.

Additionally, when evaluating social activities on an interview day, 81% of respondents felt that the opportunity to have breakfast with the program leadership improved their experience. Fifty-six percent of respondents reported they preferred an applicant dinner at a resident's home. Additionally, dinner at residents' homes received a higher overall rating than dinner at a restaurant.

Conclusions: Residency programs place a lot of effort into recruiting the best candidates for their institution. During interview days, programs work to provide the applicants with information on both the educational aspects and wellness aspects of the program. According to our survey, applicants are interested in participating in rigorous academic activities such as morbidity and mortality conference. These activities give insight into resident and faculty interactions within the program and the educational mission of the program. When learning about the more social aspects of the program, applicants prefer more casual settings such as a casual breakfast with the program leadership or dinner at resident's homes. These activities provide a venue for applicants to determine their comfort level and fit within the membership of the residency program.

378 Rethinking Education: The Wiscopkins Model - Novel Curriculum and Milestone Deployment Using iTunesU

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Study Objectives: Didactic learning in emergency medicine (EM) education has changed. Textbooks are being replaced with online materials, blogs and podcasts as learners are moving to an asynchronous learning style that constantly promotes problem-based, up-to-date and interactive learning. Given the paucity of formal, online, EM-based educational materials—it is up to educators to develop and adopt new and innovative media-based instruction methods. At the same time, both educators and clinicians are looking for novel ways to integrate ABEM's newly adopted milestones into daily practice.

This project's objective is to take the ABEM's *Model of the Clinical Practice of Emergency Medicine (MCPEM)* and transform it into an innovative and interactive educational tool - linking the subject matter to podcasts, blogs, lectures, videos and online textbooks. The goal is to develop a curriculum deployment system that is current, standardized and easily accessible by the learners while being easily trackable by the residency program director (PD). It also seeks to deploy evidence-based approaches to integrating ABEM's milestone project into educational programs and clinical practice, allowing both learners and educators access to material at the patients' bedside.

Methods: The project's design is centered around Apple's new iTunesU iOS application. The curriculum will be deployed as a self-contained "course" available to all of our trainees. Based on the *MCPEM*, residents have instant access to interactive modules that outline the physician task matrix in this document. Each module is an individual assignment that includes audio lectures, video lectures, online textbook chapters, important articles from the EM literature and links to best practices in milestone literature and evaluation. The curriculum can be deployed on either computer, iPad, iPod, iPhone. Both the individual resident and the PD can track curriculum completion data, offering unique data tracking abilities.

Conclusions: With this project, we hope to transform how a didactic educational curriculum and practical implementation of the ABEM milestones project is deployed to a set of learners. We hope to replace the static, textbook-based model with one that is interactive, engaging and applicable to today's EM training program. In doing so, we hope to prepare more engaged, better-educated and optimally trained resident physicians in the future.

379 How Does Emergency Department Crowding, as Measured by National Emergency Department Overcrowding Scale, Affect Medical Student Test Score and Clerkship Evaluation?

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Study Objectives: The effects of emergency department (ED) crowding on medical student education is poorly described but important to the education of our future physicians. Our hypothesis is that medical student education will be adversely affected by ED crowding as measured by the National Emergency Department Overcrowding Scale (NEDOCS).

Methods: Our setting was an urban level 1 trauma center with ED residents, a required 4th year medical student clerkship, an academic 19-member faculty and an approximate annual volume of 70,000. We reviewed medical student survey results, end of rotation test scores, and NEDOCS scores from 7/2010 to 5/2012 (20 4-week and one 8-week blocks). The medical-student survey evaluates their experience on a 5-point scoring system covering these topics: curriculum organization, patient care experience, bedside education, student perception of faculty and residents as educators, problem-based learning and improvement (PBLI), communication, professionalism, and use of system-based practice. NEDOCS was calculated as previously published and used to determine the percent of time each block was crowded or higher (NEDOCS ≥ 100). Weighted regression examined the

Table 1. Summary statistics for NEDOC scores and outcomes along with regression coefficients (B with SEs), p-values and r-square values summarizing the relationships between the NEDOC scores and the outcomes.

| Variable | Mean(SD) * | R ² | Increase in Student Score for increase of 11.11% in percent crowding (95% CI) p-value** |
|------------------------|---------------|----------------|---|
| Percent Crowding | 23.41 (10.33) | — | — |
| Test Score | 83.78 (1.88) | 48% | -1.32 (-1.99, -0.66) .0005 |
| Organization | 4.35 (0.24) | 6% | 0.04 (-0.04, 0.11) 0.29 |
| Patient Care | 3.91 (0.23) | 1% | 0.02 (-0.09, 0.14) .68 |
| Education | 3.84 (0.34) | 26% | -0.17 (-0.32, -0.02) 0.019 |
| Faculty/Residents | 4.10 (0.25) | 7% | 0.05 (-0.04, 0.13) 0.25 |
| PBLI | 4.04 (0.28) | 46% | -0.18 (-0.28, -0.09) 0.0007 |
| Communication | 4.19 (0.23) | 30% | -0.12 (-0.20, -0.03) .011 |
| Professionalism | 4.26 (0.22) | 42% | -0.17 (-0.27, -0.07) 0.0015 |
| Systems-Based Practice | 4.16 (0.23) | 20% | -0.09 (-0.18, -0.00) .042 |

*These statistics summarize block means, calculated as student responses averaged within each of 21 blocks.

**Regression coefficients based on the weighted regression, along with 95% Confidence Intervals for a one-interquartile range increase in percent crowding or higher (difference between block 75th percentile and block at 25th percentile of crowding).

association between average medical student test scores, average survey responses and percent crowding among the 21 blocks, between the hours of 9am to 11pm. Weights equaled the inverse of the squared standard errors of the block average for each particular response.

Results: During the study period, 211 medical students rotated through the ED and the crowding ranged from 7 to 51%. Student test scores averaged 84 ± 2 and ranged from 80 to 87 (see Table 1 for survey results). Crowding was associated with all student responses except the topics of organization, patient care and faculty/residents as educators. More than 40% variability in test scores, PBLI and professionalism were attributable to overcrowding with R-squares of 48%, 46% and 42%, respectively (p-values of 0.0005, 0.0007 and 0.0015). Smaller but significant variability in communication (R-square = 30%, $p=0.011$), education (R-square = 26%, $p=0.019$) and systems-based practice (R-square = 20%, $p=0.042$) were also attributable to crowding. All significant effects were in the hypothesized direction. Additional analyses of the effects of Severely Over-crowded or higher (NEDOCS ≥ 140) or Dangerously Over-crowded (NEDOCS ≥ 180) did not significantly add to the effect of crowding in general.

Conclusions: Our results suggest that ED crowding does adversely affect medical student education. However, limitations include several confounding variables such as time of day, time of shift and individual motions which we cannot account for during the study.

380 Theme-Based Ultrasound Education: A Novel Approach to Teaching Point-of-Care Ultrasound to Medical Students

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Study Objectives: Over the past decade the use of point-of-care (POC) ultrasound (US) has increased dramatically across specialties. In many situations, medical school graduates are asked to use US despite having limited training. Multiple curricula have been designed to teach medical students with skills in bedside US; however, no universal method exists. The objective of our study was to determine the impact of a novel theme-based US teaching session on medical student's US education.

Methods: Cross-sectional study at an urban academic medical center. We adopted an innovative way to introduce and educate third year medical students during a one-day, "theme-based, US education session" (SonoCamp). The theme for this session was "The evaluation of patients involved in motor vehicle collisions." A one-hour didactic session was given to the third-year medical students in order to review basic US physics and commonly used knobs and controls. The students were provided with reading materials, YouTube hyperlinks, and information on smart phone applications which describe or demonstrate the following bedside US techniques: focused assessment with sonography for trauma (FAST), thoracic, inferior vena cava (IVC), central line placement, and foreign body removal. Medical students were divided into small groups of 4-5 students. Each group was assigned a case study with image identification, multiple choice and fill in the blank questions, which were collected and graded upon completion. Groups rotated through the following stations: FAST, FAST timed session, IVC, positive images review, thoracic, foreign body removal, and central line placement. Medical students were taught how to evaluate patients for abdominal free fluid, pneumothorax, pleural effusion, and IVC collapse. Students were also educated on central line placement and foreign body removal. The theme-based learning was also integrated in a team learning exercise, in which each team was assigned one of eight case studies with objective questions assessing their newly acquired US knowledge. A log was kept for each medical student keeping track of the time required to complete a FAST exam, central line placement, and foreign body removal. The FAST exam was allotted a maximum of 3 minutes. A fifteen-item questionnaire was administered at the end of Sonocamp.

Results: Ninety-two third year medical students participated in this study. Seventy-two percent (95% CI, 61.73% to 81.27%) of the medical students completed the FAST exam within the three-minute time limit. Of the 16 groups, the average score on the case study questions was 82% ($SD \pm 28$). 99% students completed the questionnaire, and 93% completed all required questions. 92% (95% CI, 85.46% to 97.54%) agreed that theme-based learning is an effective learning tool for bedside US. All students agreed that team approach is an effective way to learn bedside US. 98% (95% CI, 94.29% to 100%) agreed that medical school curriculum should include POC US education.

Conclusions: The use of theme-based US education, team approach and individual challenges successfully engaged students throughout their circuit-training style education. In academic institutions where an US curriculum is not established for medical students or where resources are limited, one-day, theme-based US education is an effective educational tool.

381 An Alumni Survey Using Emergency Medicine Milestones as a Needs Assessment for Curriculum Improvement

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Study Objectives: The Emergency Medicine Milestones (EMM) are a matrix of the knowledge, skills, abilities, attitudes, and experiences that should be acquired during specialty training in emergency medicine (EM). The aim of the study was to determine if an EMM-based alumni survey could identify specific areas for residency program improvement.

Methods: We developed a milestone-based, self-administered survey to assess the effectiveness of the EM training program and to guide future curriculum development. The newly developed EMM (23 milestones, 6 core competencies) served as the backbone of the alumni survey. The survey was pilot tested and subsequently revised using current fellows as well as select faculty. The survey used a 9-point Likert scale (anchoring the observable developmental steps provided by the ACGME/RRC, Level 1-5). For the purpose of this study a score of 7 or above was considered the target level of experience for an EM graduate (Level 4 or 5). The names and e-mail addresses of the previous 10 years of residency graduates were obtained from departmental records. Responses were collected anonymously. Completion of the survey implied consent to the study. Descriptive statistics were calculated to determine the characteristics of respondents and their responses to each survey question.

Results: Response rate was 91% (86 of 97). Respondents reported achieving the target level of experience in the milestones related to medical knowledge, professionalism and interpersonal and communication skills at the time of graduation (Table). The competencies where the average response was below the graduation target level of experience were patient care (PC, 6.9 $SD = 0.5$), practiced-based performance improvement (PBLI, 6.8 $SD = 0.5$) and systems based practice (SBP, 6.5 $SD = 0.7$). PBLI consists of only one milestone which has trended steadily upwards for the last 5 years. SBP consists of three milestones; patient safety, systems-based management and technology, all of which were found to be deficient (averaging 6.5 ± 0.7 , 6.7 ± 0.4 and 6.2 ± 0.8 , respectively). Of those three, technology has been trending consistently upwards for the last 5 years, meaning systems-based management and patient safety were the only two deficient milestones that did not show consistent improvement in recent years and were identified as areas needing improvement.

Patient care consists of 14 milestones, three were found to be individually deficient; pharmacotherapy (6.8 $SD = 0.5$), ultrasound (6.1 $SD = 0.6$) and wound management (6.6, $SD = 0.4$). Ultrasound was found to have trended upwards for the last 5 years, but wound management and pharmacotherapy had been inconsistent and below 7 in recent years, indicating a need for program development.

Conclusions: An alumni survey can provide useful outside measures for training programs to assess their effectiveness in preparing their graduates for independent practice. Alumni perception of their graduation competence and historical trends in achieving the newly proposed EM milestones can provide a blueprint for program improvement.

Alumni Evaluation of the Six Core Competencies

| Category | Average | SD |
|----------|---------|-----|
| PC | 6.9 | 0.5 |
| MK | 7.0 | 0.9 |
| PROF | 7.0 | 0.4 |
| ICS | 7.0 | 0.4 |
| PBLI | 6.8 | 0.5 |
| SBP | 6.5 | 0.7 |